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Concrete Pool Kit

Installation



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Concrete Pool

The main advantage of a concrete pool is that it can be built to any shape to blend into the surroundings.

Many concrete pools have been built in the past and large numbers are now under construction which are not strong enough to withstand the exceptional stresses and strains to which all pools are subjected. The usual fault is lack of knowledge, and this booklet is written to set out the correct procedure for building our special design concrete pool with a deep end hopper.

This type of pool can be confidently built by any do-it-yourself enthusiast or local builder, ensuring the greatest strength, yet economical in materials and labour. The finished pool provides diving, a shallow area for children and every facility of a conventional pool, but the gallonage of water is reduced giving considerable savings on heating and chemicals. Another advantage is that a safety ledge can be incorporated which extends around the deep end, providing greater safety for non-swimmers. When building a concrete pool it is always practical to construct steps within the pool, as besides their practical use, well planned steps certainly enhance the appearance.

If stainless steel steps are used, these form an obstruction above the pool level which can be a nuisance when using any form of pool cover.

Planning Permission

The majority of Authorities do not insist on planning permission for building a private swimming pool in your own garden.

If you are contemplating erecting an enclosure then planning permission is required, and you are advised to consult the Authorities before commencement.

Rateable Value

The construction of a sunken pool in the garden will considerably increase the value of your property, resulting in an increase in the rateable value, but proving to be a real investment by substantially enhancing the selling price of the property.

Water Rates

Most counties insist that a pool owner should have a water meter installed. This is not expensive as the actual meter is rented from the Water Board at a very nominal figure. This annual water charge is not

of any great consequence, as once filled the same water remains in the pool year after year, and water is required only for topping up.

Annual Running Costs

The annual running costs of a private swimming pool are quite reasonable. On average a private pool of 10,000 gallons will cost £300 per year, which includes the chemicals and electricity for running the filter. When this same size pool, however, is used by a school, the running costs will be multiplied due to the increased chemicals used. For costings on heating the pool, consult Practical Guide to Pool Heating.

Location of Pool

The pool should be positioned away from trees, so that it enjoys maximum sun with the minimum of trouble from falling leaves.

The following points should also be considered: -

1. The filter will require housing. Sometimes an existing building or summer-house can be utilised if near to the pool. Position the filter as "close to the deep end of the pool as possible, to obtain the maximum performance from the pump.
2. Supply of electricity.
3. Convenience of pumping water to waste, to a drain or soak-away. When the filter is cleaned, a quantity of water is backwashed to waste.
4. Availability of water supply, although usually a garden hose to the nearest tap is all that is required.
5. Proximity of pool to house, for toilets and changing facilities.
6. Possibility of using house central heating boiler for heating the pool.

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7. If an electric heater is used for the pool, this is positioned by the filter, and the distance from the electric meters in the house makes a substantial difference to the cost of electrical connection.

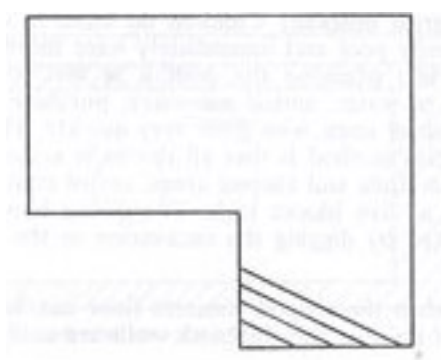
Size and Shape of Pool

The most practical shape for a pool is rectangular, and usually the length is twice the width. It may be helpful to know that 24ft. x 12ft. is really the minimum size to consider, 32ft. x 16ft. is the most popular size, and 40ft. x 20ft. is a really big pool. It is strongly recommended that a "Roman End" is built incorporating steps, the best radius being 5ft. which does add another 5ft. to the length of the pool. Where there is no space available, a Roman End can be built on the side at the shallow end.

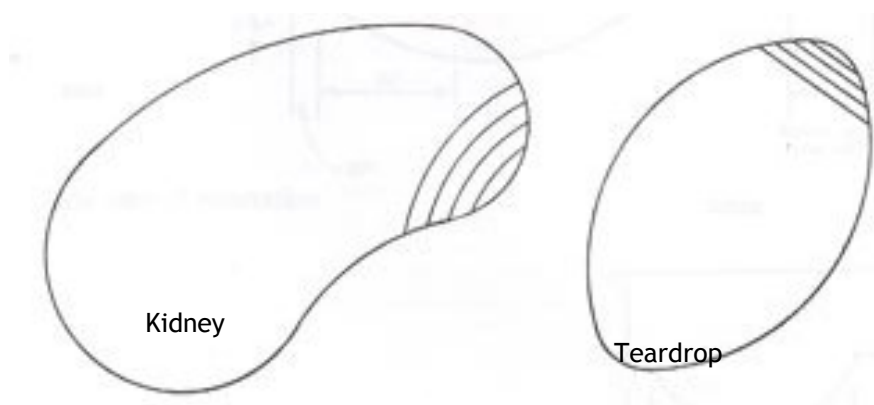
Shaped and Free-form Pools

A popular variation of the rectangular pool is the 'L' shape where the main pool is designed for adults and the remainder is devoted to steps and children.

'L' shaped



Drawn below is a "kidney" shaped pool and a 'teardrop' which are popular, although there are limitless different shapes. There is no great advantage in a shaped pool except for the finished appearance and the fact that the owner has an individual tailor made pool instead of the orthodox.



Whatever the shape or size of pool the following instructions for construction are virtually identical, with obvious differences in the digging and setting out. The pool builder has first to determine the depth required in the shallow end.

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Construction is carried out with 9in. high blocks. so it will be either four rows of blocks with 3ft. wall height giving 2ft. 9ins. of water. or more sensible five rows of blocks for a 3ft. 9ins. wall height giving 3ft. 6ins. depth of water.

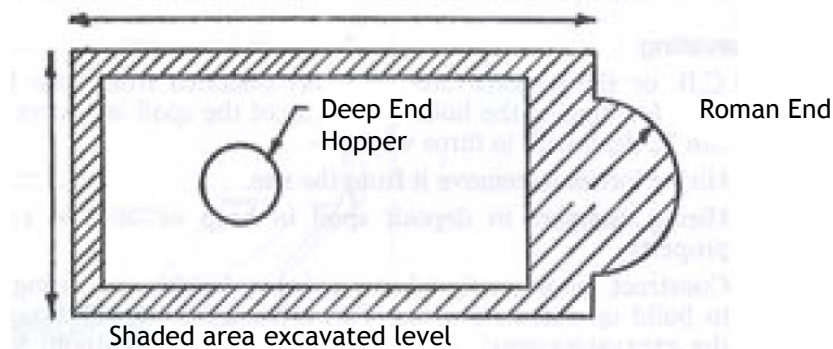
Parents with small children often choose to have a shallower pool. undoubtedly a great mistake! Children do learn to swim very quickly in their own family pool and immediately want more depth for diving; consequently. when planning the pool it is best to design it with a 3ft. 6ins. depth of water. and if necessary. purchase a cheap paddling pool for the younger ones. who grow very quickly. The great advantage of our construction method is that all the walls around the whole pool. including Roman Ends and shaped areas. are of constant height. shown in the sketches as five blocks high. The diving hopper and deep end are all constructed by digging the excavation to the precise shape and concreting.

Consequently. when the shaped concrete floor has been completed. the pool shell is half finished and the block walls are easily built on the level foundations.

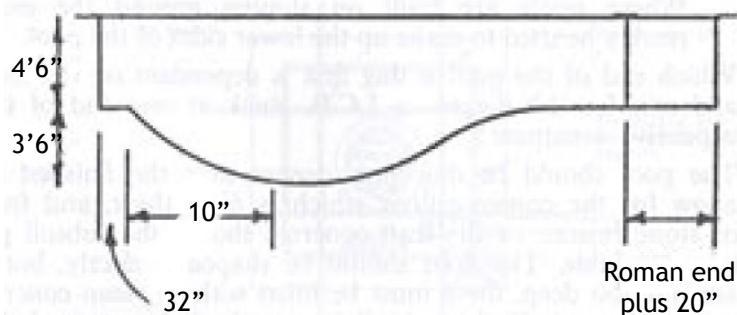
Digging the Pool

All the dimensions quoted are assuming that the pool is built on normal stable subsoil conditions. If the pool is on unstable foundations. i.e. running sand. consult for special instructions. Set out the inside dimensions of the pool and then mark the excavation lines which are 20ins. larger all round. to allow for thickness of walls and backfilling.

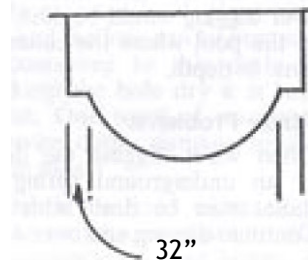
Top view of excavation



Side view of excavation



Cross section of deep end excavation



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To help determine the position of the deep end hopper, the centre of the hopper is usually 10ft. away from the inside deep end wall. The length of shallow area is entirely the builder's personal choice, but should not be more than one third of the length. If preferred, the slope of the floor can commence at the Roman End. if the pool is for swimmers only. The finished depth at the hopper is also a matter of personal choice, usually 7ft. 7ft. 6ins. or 8ft.

Excavating

A J .C.B. or similar excavator, is easily obtained from your local plant hire firm for digging the hole. Disposing of the spoil is always a problem and can be dealt with in three ways:-

1. Hiring lorries to remove it from the site.
2. Hiring dumpers to deposit spoil in heap or on low area on the property.
3. Construct pool partly above existing levels. and using the spoil to build up surround areas. This method has the advantage of using the excavating machine to carry out this work without hiring extra dumpers. but it does have the disadvantage, that the built up areas will subside and disrupt the paving in the first year.

Where pools are built on sloping ground the excavations can readily be used to make up the lower sides of the pool.

Which end of the pool is dug first is dependent on the means of access and exit for the digger-a J .C.B. stuck at one end of the pool is an expensive ornament!

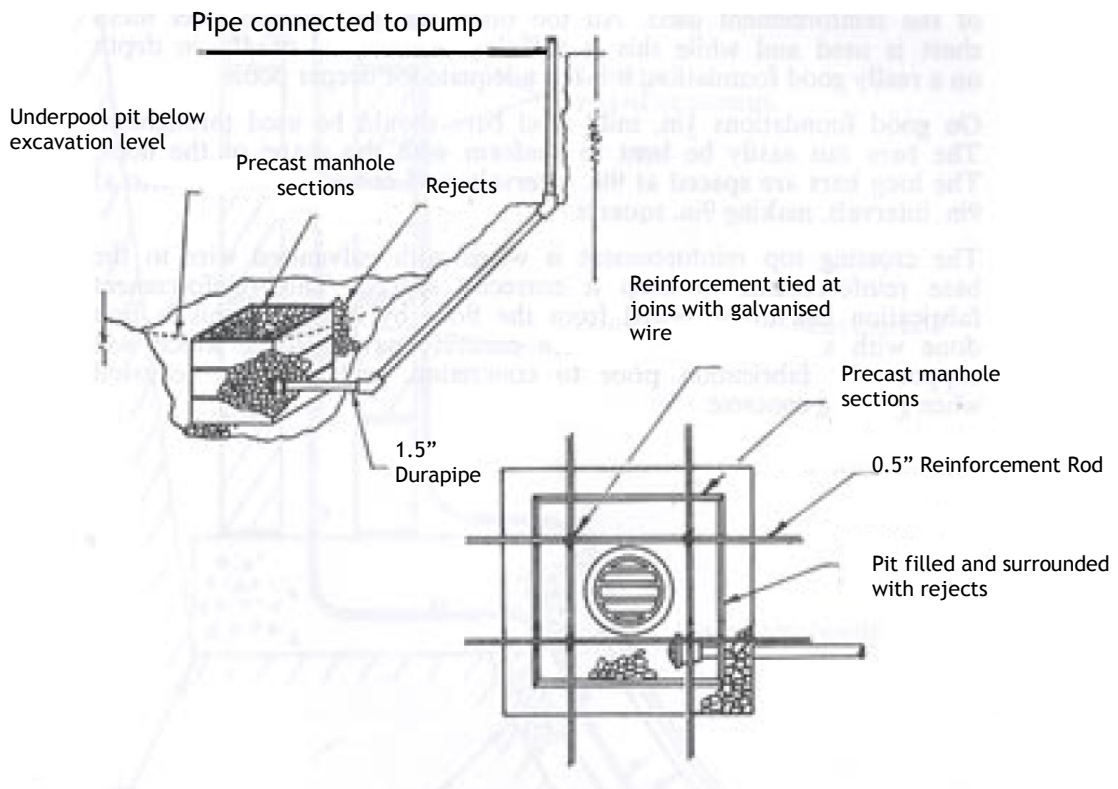
The pool should be dug 9ins. deeper than the finished dimensions to allow for the concrete floor which is 6ins. thick, and for a 3in. layer of stone rejects, or dry-lean concrete should the subsoil prove wet and unmanageable. The floor should be shaped perfectly. but if any places are dug too deep. these must be filled with dry-lean concrete to prevent any settlement. If the subsoil is gravel, shale or good draining rocky strata. then the 3in. layer of rejects is not necessary and the concrete floor can be laid direct onto the subsoil. In these conditions the over digging would be 6ins. instead of 9ins except around the perimeter of the pool where the concrete foundations of the pool walls are always 9ins. in depth.

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Water Problems

Often when digging the deep end hopper, water will seep in slowly or an underground spring may discharge a large volume of water; these must be dealt with to keep the hole dry during construction. Continue digging and over dig at the deepest point by 2ft.

Purchase three concrete rectangular manhole sections and fix these one on top of the other in this pit. The underpool drainage pit is then filled and surrounded by reject shingle. to allow easy egress of water into the pit. A 1.5in. pipe, either polythene or durapipe, is trenched from the centre of this underpool drain to a point beyond the proposed surround paving.



A diaphragm pump, which can be hired from your local plant hire company, is connected to the end of this pipe and the hole can be pumped dry. A second pipe and pump can be connected to this drain if necessary, but if these are not sufficient to keep the hole dry it is best to consult your nearest de-watering specialist. One word of warning: fix a strainer at the end of the pipe otherwise costly damage to the pump will be caused if stones are sucked up the pipe. If the excavation has a water problem it should be lined with a 3in. layer of clean rejects so that all the water has easy access down to the underpool drainage pit. If the subsoil is excessively wet and boggy, it is best to use 3ins. of dry-lean concrete which is porous and will allow the passage of water, but will give a dry surface to continue operations. The next operation is to fabricate the floor reinforcement.

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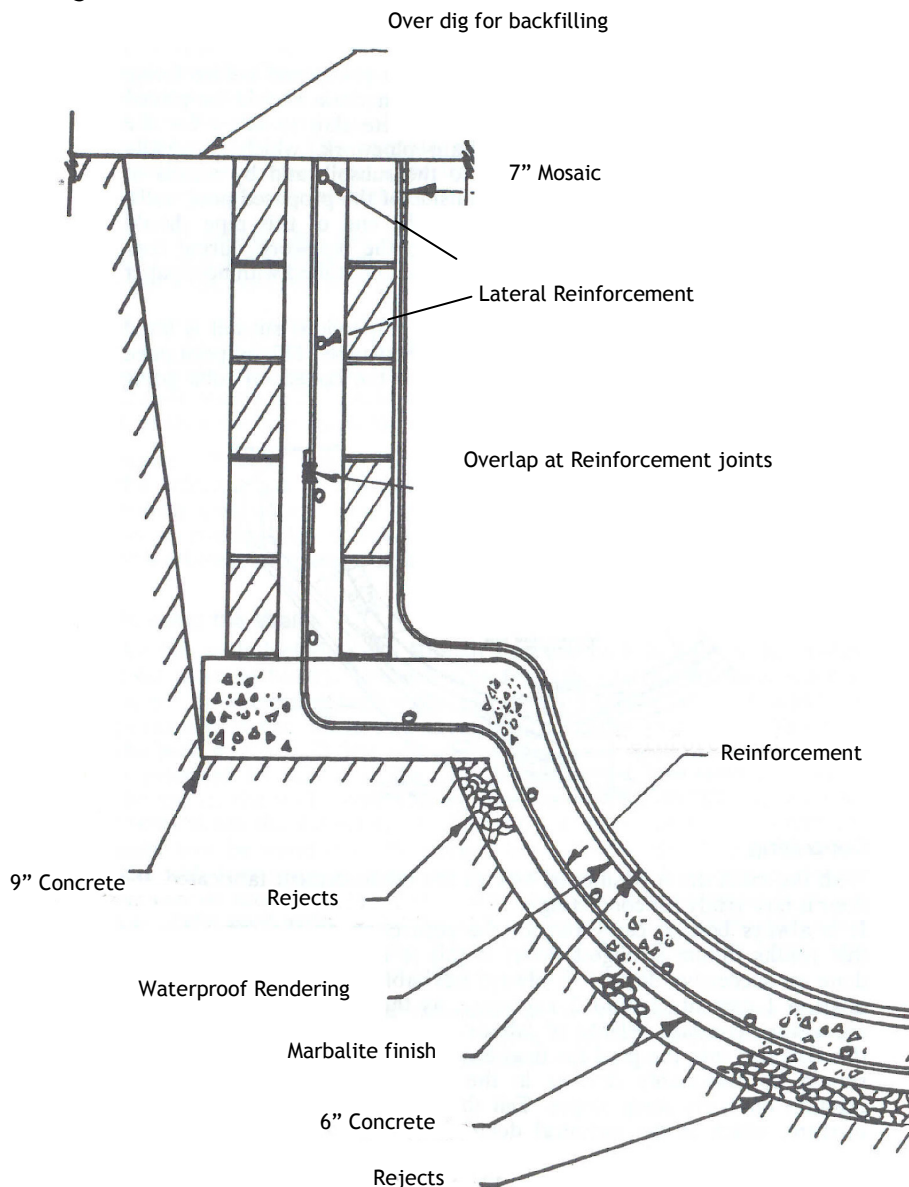
Reinforcement

The most common cause of cracking in concrete pools is the inadequacy of the reinforcement used. All too often the tin. welded steel mesh sheet is used and while this is sufficient for a pool of 4ft. in depth on a really good foundation, it is not adequate for deeper pools.

On good foundations 0.5 in. mild steel bars should be used throughout. The bars can easily be bent to conform with the shape of the floor. The long bars are spaced at 9in. intervals. and crossed with bars also at 9in. intervals, making 9in. squares.

The crossing top reinforcement is wired with galvanised wire to the base reinforcement to keep it correctly spaced. This reinforcement fabrication has to be raised from the floor by 2ins. and this is best done with small pieces of broken concrete paving slabs, which will support the fabrication prior to concreting, and must be removed when pouring concrete.

Sketch showing reinforcement



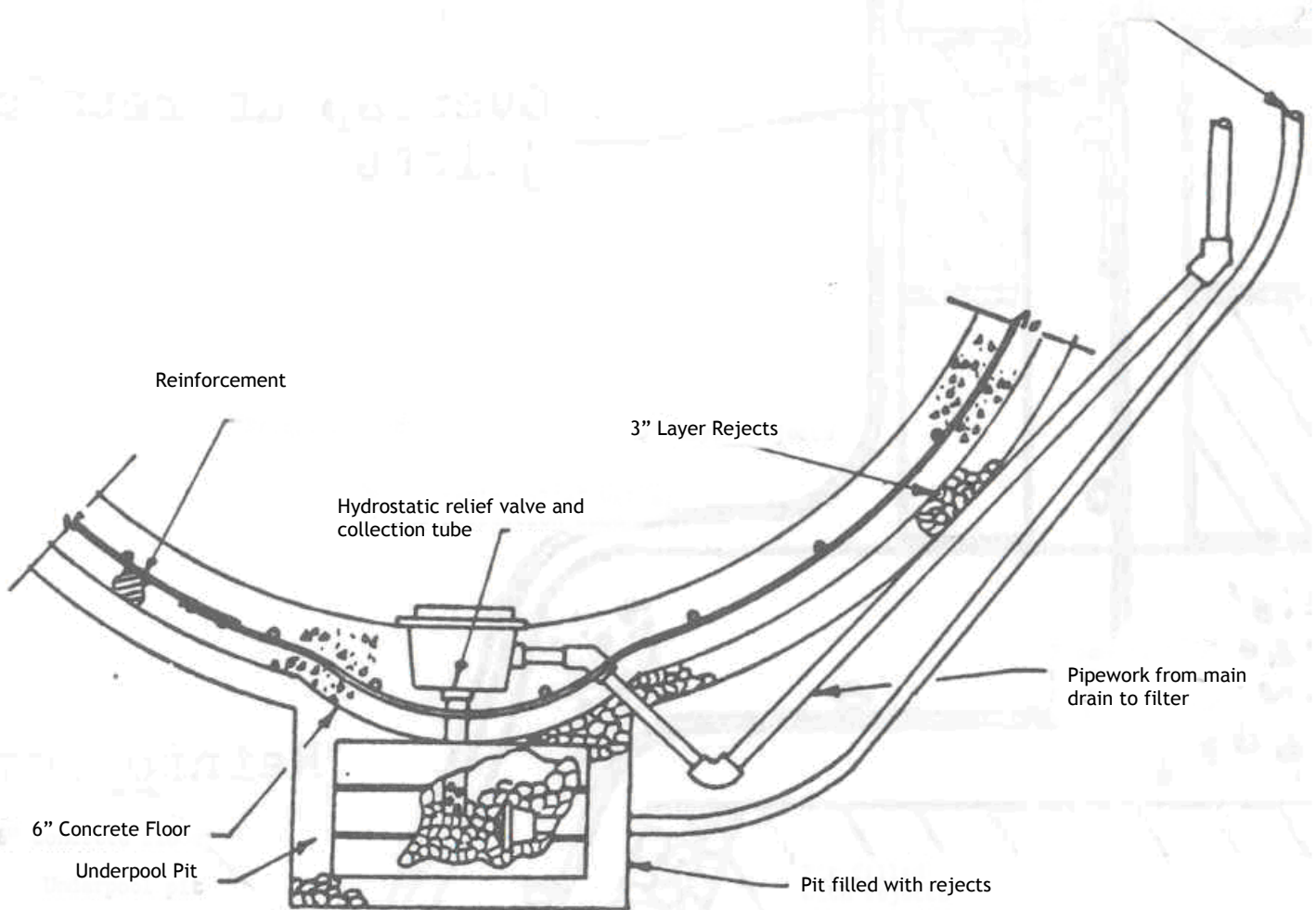
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Locating the Main Drain and Pipework

The pipework from the main drain should be positioned before fixing the reinforcement for the pool floor. The main drain should be placed with the top 1 ins. above the finished concrete slab to allow for the rendering and finishing. The main drain pipework, which is usually 1.5" durapipe, should be trenched into the subsoil, and by means of 45° and 90° elbows, extending to the outside of the proposed pool walls, and brought up to the top of the pool. The end of this pipe should be sealed to prevent any debris falling into the pipework during construction. Similarly, the main drain pot should be stuffed with newspaper to keep out concrete during construction.

The main drain in wet conditions or on an impervious subsoil is fitted with a hydrostatic relief valve and a collection tube. This is positioned in the middle of the deep end hopper, with the collection tube going down into the underpool drain.

Pipe to diaphragm pump



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Concreting

With the main drain positioned and all the reinforcement fabricated. the floor is now ready for concreting.

It is always best to carry out all the concreting on the same day, as this results in the strongest floor; if this is not possible it should be done on successive days. It is always advisable to use premix concrete. mixture 1 cement. 2 sand 3 aggregate. as the proportions and mixing are always constant. Plenty of labour must be available to help move this concrete into the pool for final levelling and vibrating. The concrete should be reasonably dry. as in the deep hopper it has to stay in position on fairly steep slopes. Tell the driver you want a 2ins. slump mixture, which is the technical definition for the amount of moisture you require. Shovel the concrete into position. making sure it goes well under the reinforcement. removing the pieces of paving slab when the concrete is supporting the reinforcement at the correct height. After the concrete has been positioned. it must be vibrated with a vibrating poker. The purpose of vibrating concrete is to thoroughly agitate the mixture into a perfect dense structure with no possibilities of air spaces or air pockets.

It also means that the reinforcement is densely incorporated in the slab. and a 6in. vibrated concrete slab is stronger and more waterproof than a 9in. concrete floor that is only hand tamped.

A vibrating poker is driven by a small petrol motor with a flexible drive which terminates in the 'poker'. When the poker is pushed into the fairly dry concrete the water will rise through the cement over approximately a 2ft. circle. and this can then be smoothed over forming a really good base ready for rendering.

Again. vibrating pokers can be hired from the plant hire firms. When the arduous task of concreting the floor has been completed. the pool builder can relax a little as the remainder of the pool construction is not so concentrated or exacting. and can be carried out during evenings or weekends. progressing a little at a time.

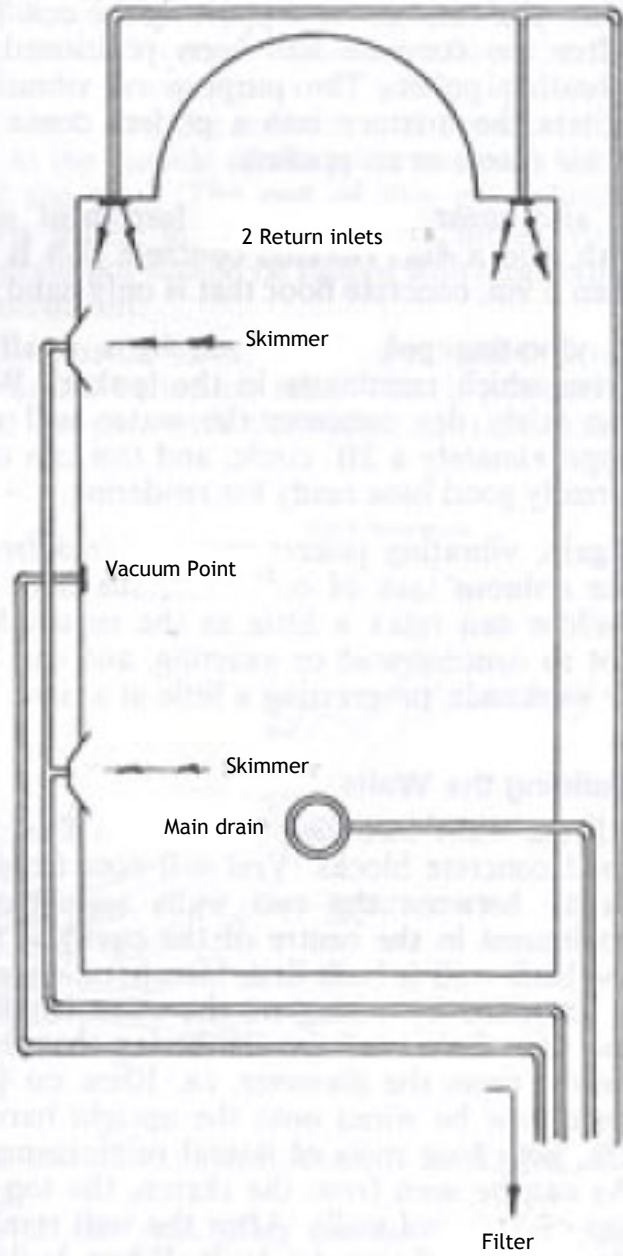
Building the Walls

All the walls including the Roman End are built in 18in. x 9in. x 4in. solid concrete blocks. You will note from the sketch that there is a 6in. cavity between the two walls and that the reinforcement which is positioned in the centre of the cavity is extended to the top. Naturally the back wall is built first. incorporating wall ties. then the reinforcement is extended by wiring on the extra length required to take the iron to the top of the wall (remembering that the overlap on the bar must be twenty times the diameter. i.e. 10". on 1/2in. bar). Lateral reinforcement must now be wired onto the upright bars at intervals of approximately 1ft. with four rows of lateral reinforcement on the five rows of blocks. As can be seen from the sketch. the top lateral reinforcement is at the top of the pool walls. After the wall reinforcement has been fabricated. the front wall can be built. When building the walls take great care that surplus cement does not fall down into the cavity.

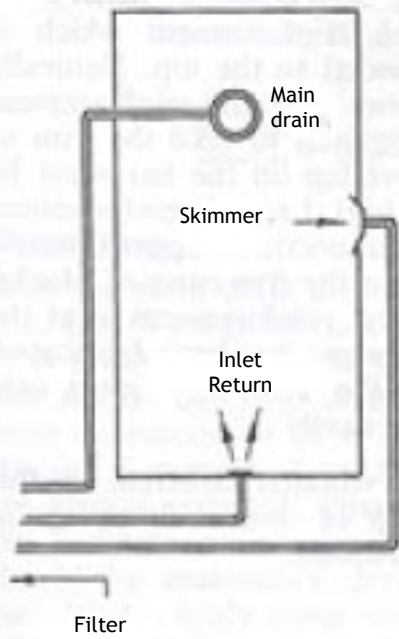
The strength of the walls depends on the vibrated concrete in this cavity. which is carried out later. and a layer of cement droppings at the bottom of the cavity will weaken the construction.

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Plumbing layout of larger pool with separate vacuum line



Layout on smaller pool up to 12,000 gallons with one return and skimmer used to operate pool vacuum.



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Positioning the Pool Fittings

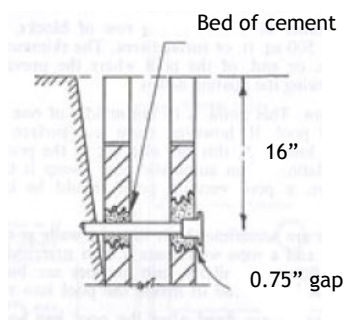
There are several fittings that must be built into the walls of the pool as work progresses, and these vary according to the size of the pool: -

1. Main drain at deepest part of pool.
2. Return inlets, usually two at shallow end of pool, 16ins. from top.
3. Underwater light in the middle of the deep end wall, 30ins. down.
If two lights are fitted these are usually equally spaced in the long wall nearest the house. The reason for this is that it is preferable to see the translucent glow of the illuminated pool from the house windows. without actually seeing the light units.
4. Surface skimmer fitted in the top row of blocks, one skimmer is required per 500 sq. fl. of surface area. The skimmers are positioned on that side, or end, of the pool where the prevailing wind most assists in blowing the floating debris.
5. Vacuum point. This point is in the middle of one long wall 16ins. from top of pool. If, however, there is a surface skimmer in the middle of a long wall. this can also act as the pool vacuum point. If the installation of an automatic pool sweep is thought probable in the future, a pool vacuum point should be installed for this purpose.
6. Cup anchors are sometimes built into the walls at the shallow / deep end division and a rope with floats is then stretched across the pool from these fittings. Similarly, cup anchors are built into the end walls when it is required to divide the pool into racing lanes.
7. Handrails are always fixed after the pool has been built and *no* provision has to be made for these in the walls.

Pool Fittings

The pool fittings. with the exception of the surface skimmer mentioned later. are all built into the wall as the correct fitting height is reached. The inlet returns and pool vacuum points have an 1 Sin. length of durapipe ready plumbed for installation.

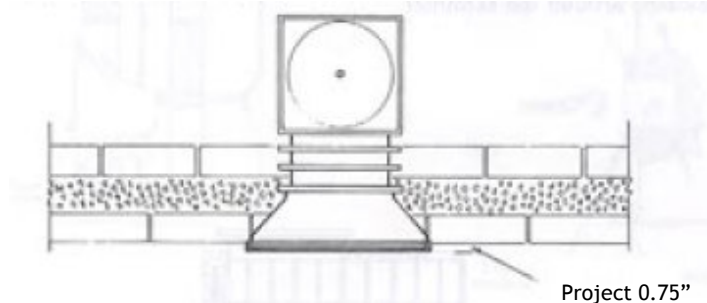
A small section of the blocks are chipped away with a chisel to enable the pipe and fitting to lie in a bed of cement. This should be bedded deep enough to allow a bed of cement before the next row of block\$. Always remember to have the front face of the fitting 3/4". from the face of the block to allow for the final rendering and marbalite or mosaic finish. This applies to all fittings except the surface skimmers.



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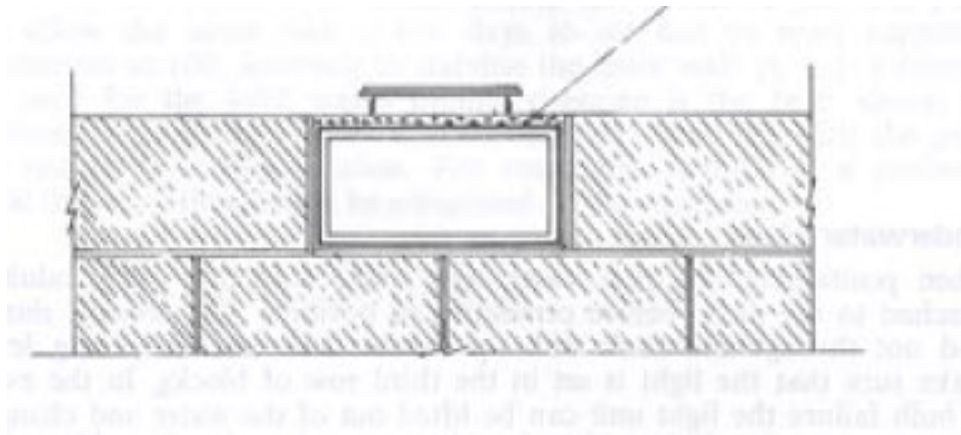
Surface Skimmer

The surface skimmer with angled extension throat is bedded onto a bed of cement. with cement carefully tamped around the sides. The front of skimmer, with the faceplate glued in position, should project 0.75". from the face of the blockwork to allow for rendering and mosaic.

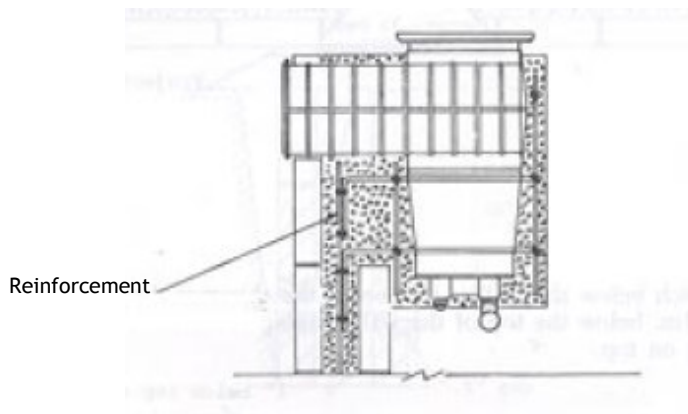


The sketch below shows that the top of the skimmer throat is approximately 1 in. below the top of the wall, leaving room for 1 in. of cement finishing on top.

1" below top of wall



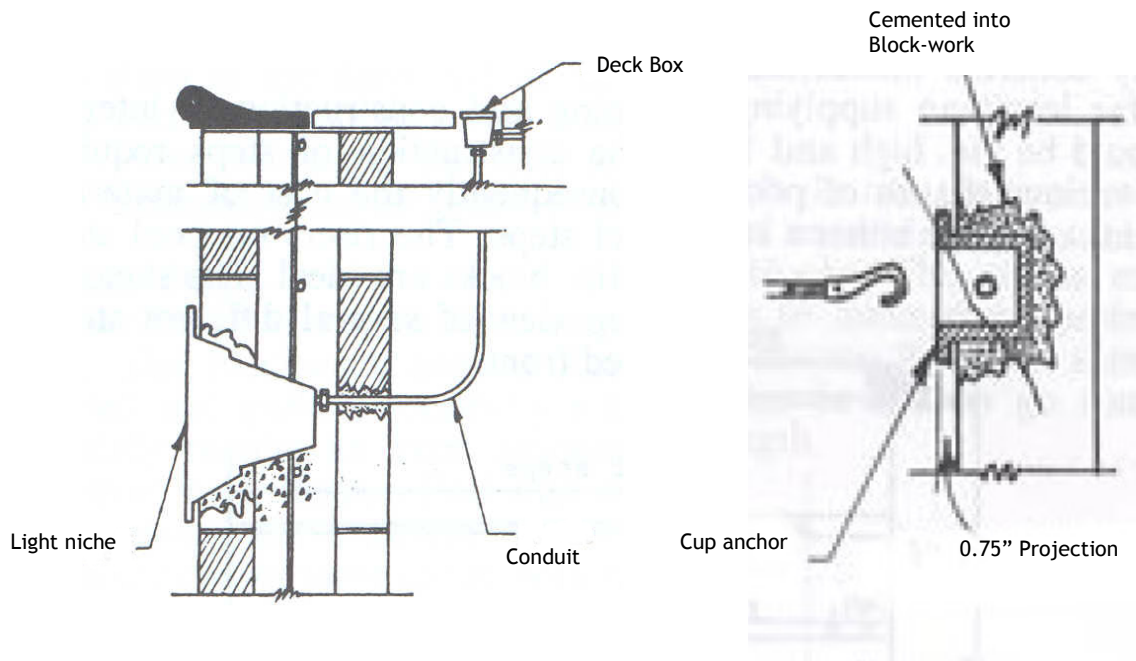
The body of the skimmer is outside the pool wall, and it is advisable that a box of concrete is built around this body which is tied to the pool wall with reinforcement. This is a safeguard against subsidence of the backfill, breaking off the body of the skimmer which is an expensive job to replace. The sketch below shows how the reinforcement should be fabricated around the skimmer.



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Underwater Light

When positioning the underwater light make sure that the conduit is attached to the niche before cementing in position. The conduit should lead out through the back wall up to the deck box at paving level. Make sure that the light is set in the third row of blocks. In the event of bulb failure the light unit can be lifted out of the water and changed above water level. It is replaced with the surplus electric cable coiled behind the light. The niche should be thoroughly concreted with reinforcement tied into the pool walls in the same manner as the skimmer.



Cup Anchors

These require a small hole knocked in the top course of blocks and are cemented in position. The face of the anchor should be in. proud of the block face.

Infilling between walls

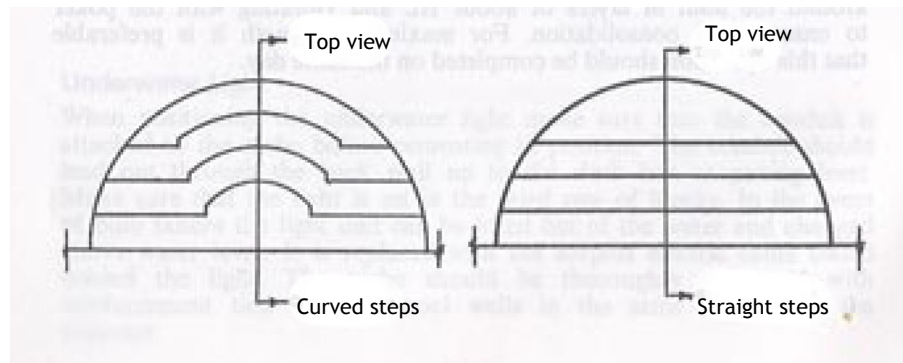
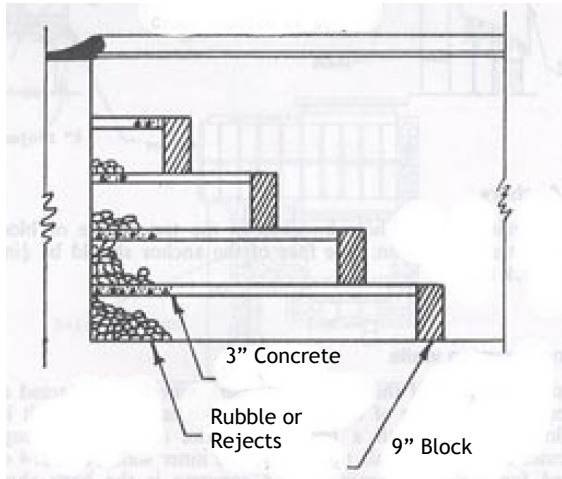
The strongest part of the walls *is* the 6ins. vibrated reinforced concrete between the two rows of blocks. Before this is carried out, *it is* policy to allow the inner wall a few days to set and to erect supporting buttresses at 10ft. intervals to stabilise the inner wall. A1: 2 : 4 concrete *is* used for the infill, again premix concrete is the best; shovel this around the infill in layers of about 1ft. and vibrating with the poker to ensure even consolidation. For maximum strength it is preferable that this operation should be completed on the same day.

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Formation of Pool Steps

As mentioned before, attractive designing and construction of internal steps can greatly enhance a pool. The construction of steps requires only concrete blocks and concrete, consequently the cost of materials is far less than supplying stainless steel steps. The risers on pool steps should be 9in. high and 18in. x 9in. x 4in. blocks are ideal. The sketches of various shapes of pools gives the top view of several different steps. which can have either a straight or curved front.

Cross section of steps

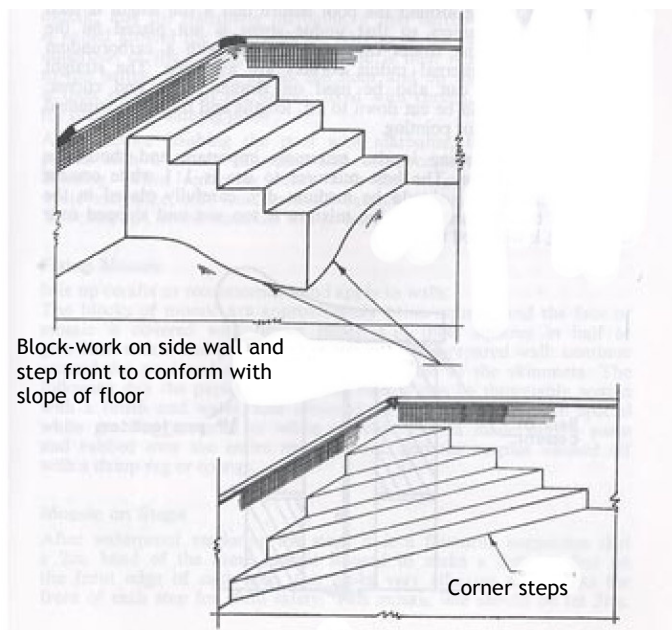


Steps at Deep End of Pool

The steps at the deep end of the pool are slightly different, being 2ft. wide and necessitating a side wall. They rise from the safety ledge and again have four steps. The base of the safety ledge has to be made wider to accommodate the 2ft. width of steps and side wall.

Corner Steps

It may be preferred to have corner steps, which do not require a side wall. The block-work around Roman Ends and around curves can be carried out quite successfully with the same blocks. The curves may certainly require an extra amount of rendering to make them perfect; however, on a Roman End with steps it is only the top 9ins. that shows. If necessary the concrete blocks can be broken in half to go round the acute curves more easily, without loss of strength.



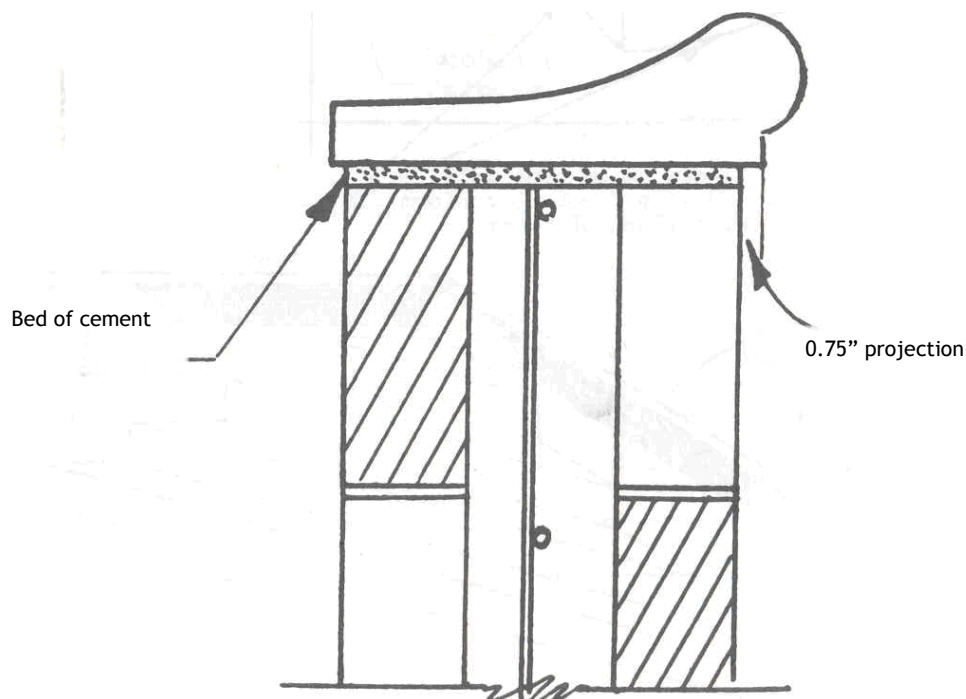
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Coping

The next operation is to render the entire pool, but first the coping must be cemented around so that the walls can be rendered up to them. Remember that the coping should protrude tin. over the inside of the pool wall to allow for the rendering and mosaic, and it must be perfectly level-use a line and level-and take particular care to make the coping perfect as this is one of the most important operations of the pool construction. When the pool is finished no one can see any of the blockwork or reinforcement or any of the work that went into the construction of the shell. All that is visible is the finished rendered inside and the coping around the top. Many a really good pool is spoilt by bad coping and many a bad pool looks excellent because of good workmanship on the finish.

When setting coping around the pool ensure that a full length is used to bridge the skimmers so that undue stress is not placed on the skimmer top. Coping stones can easily be cut with a carborundum disc and special internal radius corners are available. The straight 9ins. wide coping can also be used on Roman Ends and curves: however, they should be cut down to 1ft. lengths and the edges trimmed to form equal gaps for pointing.

The pointing of coping is also extremely important and should be carefully carried out. The best mixtures to use is 1: 1 white cement and silver sand-this should be medium dry, carefully placed in the joint, and trowel finished. If the mixture is too wet and slopped over the coping, it will spoil the finish.



Rendering

The inside of the pool shell must now be rendered with a waterproof screed: use "sealocrete" as per their recommendations.

All right-angles in the corners of the walls, and where the wall meets the safety ledge, should be rounded out with a 6in. cove of waterproof cement before rendering. The walls should be rendered first, followed by the floor and all the surfaces of the steps. Before rendering, the surface must be pasted with a mixture of cement and water which incorporates waterproofer. This sticky mixture will act as a bond between the rendering and the wall or floor preventing it 'lifting' off the surface. This first rendering should be scratched when nearly dry to give a good key for the final marbalite, mosaic, or terrazzo finish.

Assuming that the finish is to be a 7in. top band of coloured unglazed mosaic, and the remaining marbalite, a thin batten of wood tin. thick is nailed around the pool with the bottom of the batten 7ins. from the underside of the coping. The marbalite is then rendered up the walls to the batten. and then across the floor and up the steps. The batten is then removed and the mosaic fixed with cerafix, a special adhesive for tiles in a swimming pool.

Again before finishing the pool with marbalite, the area should be pasted with a slurry of water and white cement to ensure perfect bonding. When rendering either with the waterproof screed or the white marbalite, only mix up small batches of materials and keep well 'knocked-up', or the materials will go hard and unusable.

Fixing Mosaic

Mix up cerafix as recommended and apply to walls.

The blocks of mosaic are approximately 14ins. square, and the face of mosaic is covered with brown, paper. Cut these squares in half to give 7ins. width, and press this section onto the prepared wall: continue around the pool and also into the front access of the skimmers. The following day the paper covering the mosaic can be thoroughly wetted with a brush and water, and removed ready for grouting with 'special white grouting material or white cement. This is made into a paste and rubbed over the entire mosaic front, and the surplus washed off with a damp rag or sponge.

Mosaic on Steps

After waterproof rendering the steps it is a favourite suggestion that a 2in. band of the same mosaic is used to make a defining line on, the front edge of each step, this looks very effective and marks the front of each step for child safety. This mosaic line should be set 3ins. away from the front of the steps to allow for the final marbalite finish.

Other Finishes

The whole pool can be finished in mosaic if desired which will give a really sophisticated look to the pool. Any design can be used and if desired the family crest incorporated in the floor; however. the mosaic finish is a job for an expert and adds appreciably to the cost. Terrazzo tiles which are available in different colours (the tiles being 1ft. square and about 1in. thick) are sometimes used on the floor of pools. These are bedded on cement on top of the waterproof screed and cover the floor up to the safety ledge. Usually there is an ebony strip at the edge of the tiles as a contrast between the terrazzo and the marbalite or mosaic of the walls. Here again terrazzo laying is a job for the experts. A good plasterer can render the pool with marbalite which is permanently coloured and will not require painting.

The 7in. band of blue or green mosaic around the top of the pool has two functions. it makes the water in the pool look blue. although actually the marbalite is white. and the black tide mark at water level is easily wiped off this smooth surface.

Marbalite Composition

Marbalite is composed of small white marble chippings which are mixed with white marble

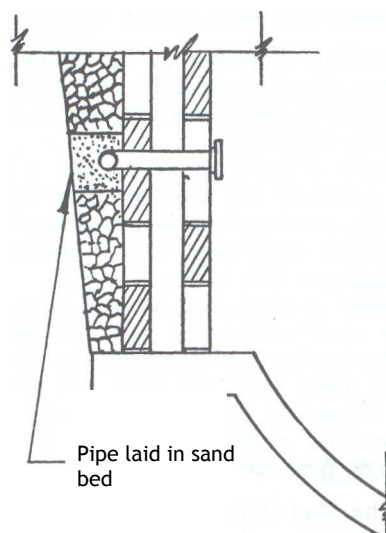
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dust and white cement This is mixed with water and rendered onto the surface about 3/16th to 1 in. thick. A product called 'Marbline' is obtainable, incorporating all the ready mixed ingredients, including waterproofer, and is sold in 1 cwt. bags. 1 cwt. Marbline is sufficient to cover approximately 5 sq. yds. If a perfect job has been made in applying the Marbline, it is not necessary to disc the surface. However, if trowel marks are visible, the whole surface should be lightly disced off with a fine carborundum disc (grade 80). The discing should be carried out approximately 24-hours after completion of the Marbline application, the pool then carefully brushed out to remove all the resulting dust, and the pool filled immediately. If discing is not carried out, the pool should be filled approximately 24-hours after completion of the Marbline application. The Marbline can be applied 24-hours after completing the rendering and fixing the mosaic.

Note: Before filling the pool it is essential to remove all Marbline dust from the main drain, as this can set hard and block up the main drain pipework.

Backfilling

There is a reasonably small gap of 6ins. only if the excavations were accurate; use gravel or rejects in layers of 1ft. around the pool, taking the backfill up to just below the plumbing points, approximately 2ft. down, and thoroughly consolidate.



The pipework should then be attached to the bottom of the skimmer (or skimmers) and piped back to the filter. The pipe from the main drain which was positioned early on in the operations should be cut to the correct height, a 90° elbow glued and the pipework taken back to the filter. The vacuum point will require another 90° elbow glued for the third suction line back to the pump. On private pools these lines would be all 1.5in. durapipe. The two return inlets should be joined as per the plumbing layout sketch, and trenched back to the filter, or heater if fitted; these pipes all go in the same trench. The actual pipes should be laid in a bed of sand in the trench, and covered with sand to prevent damage; the backfilling can then be completed with gravel or rejects.

Paving

Non-slip paving slabs should be used, and the falls should be away from the pool, to prevent dust and debris collected on the paving from washing back into the pool. The paving and subsequent landscaping around the pool can give it that final finish that a good pool deserves.

Pool Filtration

Various different types of filtration equipment are available; however, by far the easiest to operate and maintain is the rapid sand filter. The fine particles of dust and debris suspended in the pool are trapped out as the water is passed through a bed of specially graded sand.

Cleaning this type of filter is performed by passing the water through the sand in the reverse direction, and the dirt trapped in the top layer is floated out and pumped to waste; this operation is called 'backwashing' and takes approximately 2 minutes.

All modern filters have a multiport valve with a lever that is easily moved to different positions for filtering, backwashing, or emptying the pool. These filters are supplied with a self-priming pump which means that the filtration equipment can be positioned above water level in a suitable building or filter house.

The heating equipment is sited next to the filter, and it is best to have the filter house sited between the pool and the house to minimise the length to run the services for operating the filter and heater. The filter is usually 10ft. away from the pool, but this can be extended to 100 ft. if really necessary, although the diameter of the pipework and the size of the filter pump would have to be made larger to accommodate the longer pipe run.

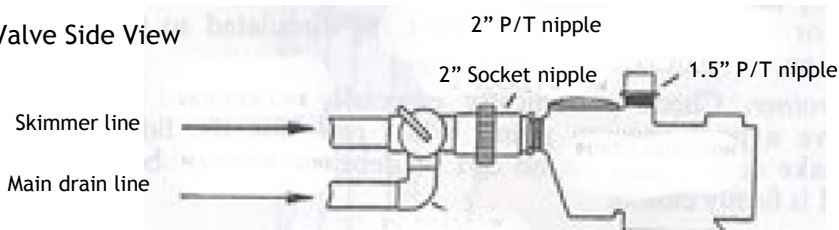
For a private pool the filter pump should turnover the whole contents of the pool in 8 hours. Thus for an 8,000 gallon pool a filter rated at 1,000 gallons per hour will give an 8 hour turnover. When dealing with school and hotel pools which have a higher bathing load, the Authorities insist on a maximum of 4 hour turnover. During the bathing season on a private pool, the filter should turnover the contents at least once per day; and if the pool is not crystal clear after checking and correcting the chemistry of the water, the filter should be run continuously until the water is perfect. More and more pool owners are now running their filters continuously, and this is an excellent practice for any pool. Besides keeping the water in perfect condition, it cuts down the amount of pool vacuuming necessary, as the surface skimmers are operating 24 hours a day, and all floating debris is sucked off before it has a chance to become saturated and sink to the pool bottom. It may be argued that this uses a lot of unnecessary electricity and must wear out the pump and motor more quickly. In fact it does certainly use more electricity, but this expense is offset by less chlorine being used, pump troubles cut to the minimum, and time spent on pool vacuuming being lessened. This system is far preferable to using a time clock mechanism for controlling the filter running, as pumps are more trouble free when continuously run than if stopped and started every day.

Concrete Pool

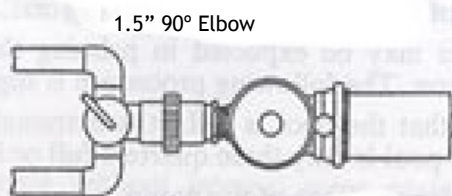
Lines

On a private pool there are two suction lines, one the main drain, and the skimmer or skimmers which are joined together on the other suction line to the filter. If a vacuum point is incorporated this will necessitate a third suction line and consequently there will be three valves in front of the pump.

3-way Flow Valve Side View



3-way Flow Valve Plan View



Pool Vacuum

Some troubles are often experienced in operating the pool vacuum, and these are usually caused by air from the vacuum hose being sucked into the pump causing it to lose its prime. To operate the vacuum, it should be assembled and placed in the pool. Take the open end of the vacuum hose to the return inlets. Place the open end over the inlet and blast the water through the hose which will push out all the air. The hose can then be attached to the suction point. Wait until the vacuum is operating satisfactorily, then close off the other valve or valves to get maximum suction. Care must be taken when vacuuming leaves from the pool bottom, because if too many leaves are sucked up the hose this can cause a blockage in the hose or in the pipework.

Always remove leaves from the pool with a leaf drag net.

If you lose suction when vacuuming it can be one of three reasons:-

1. The filter requires backwashing.

2. The coarse strainer in front of the pump requires cleaning.

3. The vacuum head or hose is blocked with leaves or similar.

After pool vacuuming the filter should be backwashed, vacuum removed and the valves returned to normal running position.

Concrete Pool

Normal Routine Maintenance

Check the basket in the surface skimmer frequently, especially in the autumn when leaves are falling. The basket can get full up with leaves and consequently starve the pump of water.

Check the pressure gauge. Always backwash the filter when the pressure reads 7lbs. above clean running pressure. Remember that when the filter is dirty the pump is using the same amount of electricity, but only a quarter or a third as much water is being circulated so the filter is working at much reduced efficiency.

Course strainer. Check periodically especially after pool vacuuming if you have a pool vacuum point. When replacing the lid of course strainer make certain there is no dirt or debris on the rubber seal and that the lid is firmly closed.

Initial Priming of the Pump at Start of Season

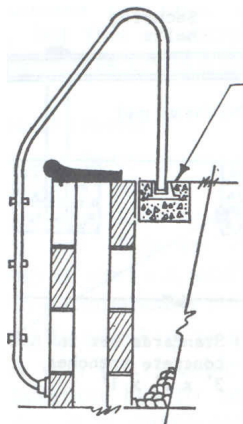
Some difficulties may be expected in priming the pump at commencement of the season. The following procedure is suggested:-

1. Make sure that the pool is full; it is extremely difficult to prime the pump if the pool is only three quarters full or less.
2. Close all valves in front of the pump.
3. Set the multi port at filter.
4. Remove top of coarse strainer and fill to the top with water, replace the top firmly.
5. Switch on pump, and immediately open one of the valves. After a minute or two the pump should start pumping and the pressure gauge will rise. If this does not happen within three minutes, switch off and go through the procedure again. When the filter is operating satisfactorily with this one valve open, the second valve can be opened very slowly. If the pressure gauge immediately drops to zero, shut off valve until the pressure has risen to normal and slowly open again. Continue in this manner until the gauge is constant with both valves fully open.

The pump can become unprimed when pool vacuuming, if the vacuum head is lifted out of the water and the preceding instructions will have to be carried out. If the pump will not prime then there is probably an air leak in front of the pump. It could be that the top of the coarse strainer is not seated correctly, or the socket union between the pump and the valves not fully tightened, or that the rubber gasket has not been replaced in the socket union. On older pumps, if priming is difficult, there may be a leak between the pump and the pump motor, which is noticed when the pump is switched off; this indicates that the mechanical pump seal is worn and should be replaced. A worn pump seal will suck air and make priming difficult.

Stainless Steel Steps

If the pool has been built without internal steps, stainless steel steps are the best to use. These are fixed into wedge anchors so that they can be moved in the winter and stored. The sketch shows how these wedge anchors are concreted into the surround paving.

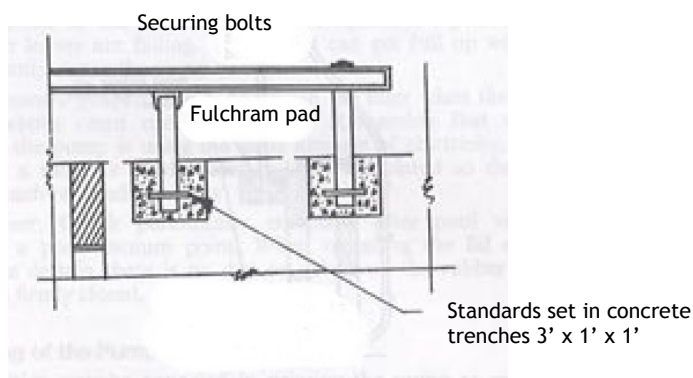


Wedge anchors set in concrete trench 2' x 1' x 1'

Concrete Pool

Diving Boards

Diving boards add a great deal of enjoyment to the use of a pool, and there are different types available. The most durable of all are the fibreglass boards, being completely impervious to all weathers. The older type of laminated wooden boards tend to deteriorate and the laminations split due to extremes in temperatures. Spring boards are 14ins. or 18ins. wide, and have a permanent non-slip finish. Older types have coconut matting as a surface, but this often needs replacing. Spring boards come in different lengths, and also the standards on which they are mounted are of different heights. The boards have two holes for the securing bolts at the rear.



Electrical Connections

It is essential that a competent electrician should wire up the underwater light, filter motor and boiler, as incorrect wiring can be exceptionally dangerous. The basic requirements are mentioned.

Underwater Light

The distance from the deck-box to the transformer should be kept to the minimum to avoid voltage drop. The special cable used for this purpose is P.V.C. covered armoured 6 mms, 3 core cable, which is connected into the side entry of the deck-box with a special gland. This cable is over -lino in diameter and somewhat expensive.

Electrical Connection to the Pump

It is essential that a push button starter is used which incorporates an overload. This overload is a safety factor to cut off the supply if the motor becomes too hot. It is possible for a small stone to jam the pump impellor, and if a starter was not used this would bum out the motor.

These starters are sold in different sizes, and the 4-8 amp one is sufficient for motors up to 1 h.p. For motors 1 h.p. to 2 h.p. a starter 7-15 amps is required; these are always 220-240 volts single-phase. Your electrician will adjust the overload to suit your particular pump motor, but if the motor cuts out after running for a short period it is probable that the overload has been set too low and must be raised. This is easily adjusted; switch off the supply, undo the retaining screws and remove the face of the starter box. A graduated scale will be seen with an adjustable pointer indicating the setting. Raise the setting 1 or 2 amps and this will correct the fault. Swimming pool pump motors always run very hot, but this is completely in order, and they are designed to run continuously 24 hours a day.

Electrical Connections of Heater

Most gas heaters do not have electrical connections, but rely on a pressure switch for their safety factor.

Oil fired boilers require electricity and the electrician should wire this up to the pump starter box. This will ensure that the boiler can only be operated if the pump is working, and should the overload switch off the pump, the boiler will automatically stop.

Electric heaters are usually wired up to an off-peak supply to economise on the heating costs. A very heavy cable is used for this high electricity demand, and the installation has to be tested and approved by the Electricity Board before it is connected to the white meter off-peak supply. The electric heater is fitted with an interlock relay which is connected to the pump motor so that the heater will not operate unless the pump motor is running.

General

Do ensure that all connections are sound, and flexible conduit used to protect wiring. During the winter when the equipment is not used, switch off the supply and remove the fuses. Make sure that the filter motor and electrical switch gear are not allowed to get damp, which would cause trouble when switching on in the spring.

Winter Care

A sunken pool must be kept full during the winter.

The surrounds of the pool will freeze and expand and if the pool is left empty, the pool shell can be broken, but left full the ice inside the pool will equalise the pressure. The water level in the pool should be pumped down to two or three inches below the bottom of the surface skimmer as the rainfall over the winter will raise the water level in the pool, and if the water comes up to the pool coping and then forms into ice the coping will get forced off and broken. Pool steps and diving boards should be removed and stored, and all pool equipment drained and serviced.

It should be considered a 'must' to remove all leaves from the bottom of the pool using a leaf drag net. These must not be allowed to lie on the pool floor as they can cause nasty stains that are difficult to remove. During the winter heavy chlorination every six weeks will keep the water in perfect condition, and if ever any green algae is noticed. immediately add another shock dose of chlorine.

If a winter cover is fitted on a pool making it difficult to add chlorine periodically, a good dose added to the pool when fitting the cover will last over the winter.

In this case add 1lbs. Chlorine per 1,000 gallons of water, i.e. 10lbs. for a 10,000 gallon pool.

It is a great temptation to use the pool as a skating rink during the winter, but remember that the front of ice skates are very jagged and will damage mosaic tiles. It is possible to fix boards around the top edge of the pool which will safeguard against this trouble.

All the equipment for the swimming pool should be serviced periodically to prolong its life. A pool is similar to the family car, and necessitates some regular attention to give the best service.

The one guarantee that a potential pool owner can be assured of is that the pool will give greater enjoyment and maintain family unity more than anything else money can buy.